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Academic Writing: Origins and Impact of Eloquence

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Abstract: The article deals with the unsettled question whether academic scientific writing can be eloquent and possess some expressive characteristics and what impact it has on the reader. Historically the evolution of classical science to post-non-classical one was marked with substantial changes in the stylistics of scientific genres. Post-non-classical science is characterized by profoundly new conceptual notions, interpenetration of different forms of discourse, and the use of expressive linguistic means and emotional components in research papers. The current paper shows that notwithstanding the apparent antinomy, the formal and expressive functions of academic writing can effectively "coexist" in modern science. The objective of the present paper is to identify socio-historical grounds for tolerance to emotional representation of academic knowledge, to describe the changes in post-non-classical science, which made emotiveness possible in academic writing, to reveal the ways of communicating emotiveness in academic discourse. The main methods of this research include textual and stylistic analysis of academic articles and their titles, selected from scientific journals indexed in authoritative databases and materials of British National Corpus. It was revealed that the scope of expressive vocabulary in academic writing depends on the genre of scientific prose. The linguistic expressive means used by the representatives of both humanities and natural sciences and technology include: metaphor, metonymy, epithets, intensifying adverbs, quantifiers, the use of precedent texts, assertion of the author's style and gender identity.

Keywords: *expressiveness, emotions, genre of scientific prose, scientific article, linguistic means, scientism, language functions..*

Introduction

Today, most research is conducted within the anthropocentric paradigm, i.e. taking into account human factor. Linguistic creative activity aims at transmitting not only objective and formal-logical data, but also subjective information enriched with evaluative judgments, intuitive and emotional insights. Such information is undoubtedly richer and more versatile than purely irrational statistics. It has been established that language, along with the informative function, performs an emotional-expressive function designed not only to communicate information, but also to express an attitude to what is said, which is one of the most productive ways to influence the reader or interlocutor. Many linguistic studies of the previous

40-50 years have been devoted to identifying and describing the connections between the informative and communicative functions of language, their linguistic representations and cognitive aspects (Diller, 1992; Gallois, 1993; Jacobsen, 1979; Johnson-Laird et al., 1989; Ortony et al., 1988; The Language of Emotions, 1997; Wierzbizcka, 1999).

Emotionality of speech is almost always aims at the most effective communication and achieved by means of text intensification. Speaking about intensifiers, it should be noted that the expressiveness of the word can be realized only in human speech, it is born in a dialogue with the outside world, accompanied by certain goals, experience, intentions and speaker's mood, that is, the word in a broad sense is subjective.

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The emotiveness of language has been studied by scientists most intensively since the end of the 19th century. The founder of such studies is Ferdinand de Saussure's student, Charles Bally, one of the outstanding representatives of the Geneva Linguistic School. There are many reasons for research of the language and speech emotiveness. One of them is that linguistic representations of emotions can serve as a key to their decoding, since human emotions are not always visually expressed. This is especially true for the texts where the reader does not directly observe the author's behavior, but can recognize the attitude through language. In this case, language decodes the emotional sphere of a person.

Naturally, different genres imply different degrees of emotiveness: from strictly scientific presentations of data to lyrical genres, odes and epigrams. Such modern genres as advertising, political or sports reports, debates, etc. cannot be imagined without emotive components, since their absence can lead to the loss of the very characteristics of these genres and, in general, can result in communicative failure.

Academic writing has traditionally been regarded as a domain characterized by objectivity, rationality, and distance. The prevailing belief has often been that emotions have no place in academia, where logical reasoning and empirical evidence reign supreme. However, recent discussions in educational psychology, composition studies, and rhetorical theory have begun to challenge this paradigm, suggesting that emotions can play a significant role in the process and product of academic writing.

Speaking about scientific discourse in general and academic writing in particular, today we can state the growing scientific interest in the study of eloquence and expressiveness of these genres due to a number of reasons, which we will discuss below. Today we are witnessing the fact that lexical, syntactic and other language structures, tradition-ally characteristic of literary and colloquial genres, are penetrating into the genres of scientific prose. This process is characterized as " 'Democratic Turn' in Science Dissemination" (Guinda, 2022). Such changes arouse from the question: what is more important – science for the sake of science or science for man? The first part is obviously important, and the realization of the second one has become possible only recently, with the emergence of new communication channels, with the spread of popular science content, motivating non-scientists to learn something new, which should be conveyed in an understandable language.

Modern trends in the development of science are determined by such processes as globalization, internalization, convergence of ethnic interests, intersection and interpenetration of scientific and consumer cultures. As a result, the linguistic design of scientific knowledge also undergoes changes, since it is a registrar and translator of these processes. In this respect, academic writing is characterized by blurred boundaries, the penetration of elements that were previously alien to it. V.A. Maslova notes diffuseness of the above characteristics, emphasizing that: "Diffusion can be considered a tendency of the entire modern culture, and not just science" (Maslova, 2021, p. 9).

In regard to scientific communication, there is an opinion (Kelly et al., 2016; Mur-Dueñas et al., 2022) that today's changes result in the development of "parascientific communication" which is not filtered by strict rules of formal scientific representation of knowledge. For example, speaking about visual abstracts to scientific papers, Guinda (2022) points out their "promotional" nature as well as "summarizing" one. Such abstracts combine numerous functions and characteristics, which has become possible only with the spread of online scientific communication. The scientists call such kind of abstract as hybrid as they "merge creation and mimesis, the verbal and the visual, naturalistic and symbolic representations, and borrow elements from a variety of discourses, such as marketing and advertising, fiction literature, the graphic novel and the comic book, cartooning, photography and film." (Guinda, 2022).

Thus, the relevance of this paper is determined by the need to identify the causes of changes in modern scientific discourse and the formation of polydiscursive tendencies in it, to consider the possibility of eloquence and the use of expressive constructs in academic writing and their influence on the addressee, as well as to determine the influence of these processes on the ethos of science with its absolute, in the Cartesian sense, nature.

Materials and Methods

The main methods of this research include textual and stylistic analysis of linguistic means. The materials include academic articles, the corpus of their titles, selected from scientific journals indexed in authoritative databases and materials of British National Corpus.

Results and Discussions

Emotions in Academic Writing: Problems and Discussions

Everything in the world is changing, much in language is changing, and academic discourse is not an exception. It has evolved since first scientific publications in the second half of the 17th century and is conventionally described as "clear evidence in writing that the writer(s) have been persistent, open-minded, and disciplined in study"; that classifies "reason over emotion or sensual perception"; and that implicates a reader who is "coolly rational, reading for information, and intending to formulate a reasoned response" (Thaiss and Zawacki, 2022, pp. 5-7).

The limited scope of the current article and the objectives of the study do not imply conducting a detailed analysis of the stages of science development and its main ideals. We will deal with the changes in the scientific style associated with the transition from the classical to the post-non-classical paradigm of scientific research. Except terminology, academic writing style was not a subject of linguistic research until the middle of the 20th century. The emergence of a specific genre – an academic research article - dates back to the second half of the 17th century. Before that the works by G. Galileo and I. Newton had referred to "scientific law" which was supposed to be free from all manifestations of mythology and anthropologism and the main objective of science was the "discovery of the law". This trend was continued by all subsequent scientists who pursued their scientific goals presenting the results of their research in a concise and accurate way: value-neutral, avoiding emotional interpretations, since such would contradict the formal abstract-logical interpretation of scientific discoveries.

In 1662, intellectualists from Oxford and London cooperated and founded a chartered organization "The Royal Society of London for Improving Natural Knowledge" with the motto "Nothing in words" (Latin: Nullius in verba), implying that science is to be based on strict data, experiment and calculations. Eloquence in the language of science was prohibited, since "it is contrary to reason and abets passion" (Barbalet, 2004, p. 248). It was apparently believed that passionate or emotional language could belittle science. Only a detailed, reliable, statistical, impartial description of scientific achievements was welcomed. However, a lot of scientists actually would not have succeeded in their research if they had not experienced violent emotions while working.

The idea of complete objectivity in academic writing has been criticized for oversimplifying the complex human experience of knowledge perception and production. Emotions are an integral part of all human activities, influencing how we reflect, categorize, and interact. Academic writers often find their research interests in personal experiences or passions which enrich their narratives, making their arguments more compelling. For instance, W. Harvey, upon the opening of systole and diastole, spoke of the experienced emotional turmoil caused by confusion (Harvey, 2022). In his research great Albert Einstein relied not only on objective statistics but also on his intuition and imagination: "Einstein was not led to his theories of special and general relativity through attention to data alone, as if following some experimental breadcrumbs. His theories were the offspring of his imagination as much as anything else" (Ellerton and Brown, 2018). According to M. Gross, "human emotions are not just fuzzy feelings but 'real' in an objective scientific sense, inasmuch as they produce measurable signals in reproducible experiments" (Gross, 2013, p. 501), as a result, we can assume that emotions are inseparable from scientific research.

Michael Polanyi, an English philosopher, chemist and physicist, in his 'Intellectual Passions' declares his commitment to passions, highlighting their heuristic and persuasive functions in science: "The outbreak of such emotions in the course of discovery is well known, but they are not thought to affect the outcome of discovery. Science is regarded as objectively established in spite of its passionate origins. It should be clear by this time that I dissent from that belief; and I have now come to the point at which I want to deal explicitly with passions in science. I want to show that scientific passions are no mere psychological by-product, but have a logical function which contributes an indispensable element to science" (Polanyi, 1974, p. 134). The idea of the importance of intuition and emotions in scientific insights is also shared by Leo Szilard: "The creative scientist has much in common with the artist and the poet. Logical thinking and an analytical ability are necessary attributes to a scientist, but they are far from sufficient for creative work. Those insights in science that have led to a break-through were not logically derived from preexisting knowledge: The creative processes on which the progress of science is based operate on the level of the subconscious" (Lanouette, 1994).

Also relevant is the fact that emotions can act as catalysts for critical thinking. When authors personalize their academic writing, incorporating their feelings and experiences into it, they often engage more profoundly with their material. This can result in a deeper analysis of complex ideas and enable authors to develop a unique voice in their writing. Emotions can drive inquiry, prompting questions and reflections that might not emerge in a purely rational exploration of a subject. “In the Western academic tradition, the writer is an intellectual, a thinker, a user of reason. This identity doesn’t mean that emotions or sensual stimuli are absent from academic writing: indeed, the natural sciences have al-ways depended on acute sensate awareness, detection of subtle differences in appearance, fragrance, flavor, texture, sound, movement; moreover, the arts and humanities would not exist without the scholar’s intense and highly articulated sensual appreciation. As for emotion, every discipline recognizes at the very least the importance of passion in the ability to dedicate oneself to research, acknowledged as often tedious” (Thaiss and Zawacki, 2022, p. 6).

In Russia, the style of scientific presentation and scientific language began to take shape at the beginning of the 18th century. The works by M. Lomonosov, who is considered to be the founder of Russian science, and his followers played a significant role in the scientific style development. At the same time, we know Lomonosov’s verses written by him in order to illustrate some scientific laws and discoveries. His verse “About the Nature of Things. Lucretius” illustrates the proposition that ore minerals are sometimes ex-posed by nature itself. His “Iron, Gold, Copper... “ tells the reader about the birth of metals. Thus, the scientist is sure to have experienced emotions and the desire to express them in a different from academic style way.

Linguists define some specifics of the scientific style: “the complexity of syntactic constructions; lexical, stylistic and compositional stereotyping; the subordination of aesthetic properties to the pragmatic attitudes of the author; the regulated nature of the use of the emotional possibilities of the word; the predominance of objectivity in presentation; a combination of a subjectless (impersonal) method of presentation with the expression of the subjective opinion of the scientist (author); the widespread use of symbols, formulas, graphic constructions, etc. “ (Bocharnikova, 2011, p. 79).

Within the framework of modern scientific discourse, the informative function, which implies regularity, discreteness, correctness, and, on the other hand, the expressive function, which is characterized by markedness, non-discreteness, non-standardness, illogicality, are not opposed to each other. Despite the antinomy, these two components successfully “coexist” and, moreover, “cooperate”, promoting the act of communication (Abrosimova and Bogdanova, 2011, p. 162].

If earlier the opposition of ratio and emotio was clearly expressed in academic communication, now the emotional component is recognized as important on a par with the rational and factual content of the statement. In particular, in educational practice, a scientist often uses proverbs and sayings as an additional means to enhance the expressive function to enhance the information function (Belousova, Epritskaya, 2018). Today we also witness the incorporation of some previously «alien» elements – linguistic expressive means – into academic dis-course, which we will discuss below.

Classical vs Post-Non-Classical Science: from Rigidity to Flexibility

In order to explain this “ratio-emotio” cooperation, it is crucial to record some major changes in post-non-classical science. Changing of the science social status, democratization of scientific discourse. Today one of the primary objectives of academic writing has become to engage the reader. Emotions can serve as an influential tool in achieving this goal. Unlike purely rational arguments, emotionally charged narratives can resonate on a deeper level, promoting better connection between writers and readers. As a result, “the traditionally sanitised academic discourse, which so many scholars have characterized as formal, depersonalised and factual, is acquiring a casual tone more fit for an informal conversation” (Guinda, 2022). All the more so because the interest to scientific topics of non-specialists is increasing today, consequently, there is the necessity for enhanced democratic frameworks facilitating interactions between scientists and lay audiences.

The convergence of social, humanitarian and technical knowledge, and theoretical pluralism. Classical science accepted the truth of one explanatory theory, non-classical science was based on the prin-

ciple of complementarity, post-non-classical science allows the coexistence of many theories about the same objects, each of which claims to be true, and only the transition from one theory to another allows one to get to the heart of the matter. The expansion of the research field, the emergence of cognitive science based on interdisciplinarity has led to the advent of new understanding of scientificity, an expanded interpretation of "scientific rationality", the development of a more capacious conceptual apparatus, including the concepts of "information", "probability", "chaos", etc.

New research tools. A significant innovation of post-non-classical science is the widespread use of the tools called "human-sized" (V. Stepin): objects of genetic engineering, robots, cyborgs, artificial intelligence. These objects raise moral, ethical and legal questions to the scientific community, thus, non-scientific factors have a significant influence on the formation of the science object.

The emergence of new channels and formats for dissemination and popularization of scientific knowledge among the general public. There are numerous innovations in propagation of scientific research: graphical abstracts, videos, presentations, poster presentations; new hosting services (blogs, podcasts, social networks, virtual museums and exhibitions, billboards), and diverse scientific events (lectures, workshops, festivals, contests, marathons). This has become possible due to the affordance of expanded medium context. At the same time this factor has launched a challenge for scientists, "who need to embrace multimodal and multimedia means of communication. Research findings and implications must reach not only multiple stakeholders, but also an audience of laypeople" (Mur-Dueñas and Lorés, 2022).

Is there Anything Wrong with Witty Titles?

There is an opinion among linguists that, despite the fact that authors of scientific papers adhere to the scientific style, the manifestation of the author's uniqueness, the presence of the author's assessment, as well as the use of speech figurativeness in the scientific style are inevitable (Nikolaeva, 2023; Skripak, 2008). Backtracking from rigor is also justified by the desire to convey the scientific knowledge to a wide audience.

These days, when naming academic papers, researchers resort to using not only formal, but also expressive means in order to draw the target audience's attention to their scientific results, to stimulate the public interest to them, by this implementing the phatic and informative functions of the language. There are no longer strict frameworks implying the brevity and clarity of the title. Rather, on the contrary, now some authors, competing with colleagues, create intriguing titles that are far from brevity and clarity, often with a humorous subtext implying "emotional marketing and branding"(Gómez-Cabranes, 2013). The scrutinized analysis of more than 2000 scientific papers titles suggests that "humour in the title can increase a paper's impact" (Heard et al., 2022).

Linguists reveal a direct dependence of the success of the reader's perception of the text on the linguistic techniques used by the author. Here are some examples of modern scientific paper titles found in reputable databases. The Human Microbiome Journal (No. 13, 2019) published an article entitled "The Effect of Having Christmas Dinner with In-Laws on Gut Microbiota Composition" (Clercq et al., 2019). This article received more than 3,300 comments and 850 tweets. Moreover, the article «launched» a chain of further publications, apparently provoked by the unusual and funny title. The further articles are called "Feast Studies: Does Food Disrupt Gut Flora? " (Studien zum Fest..., 2019). We also find an article on a Dutch website entitled "Christmas with the Mother-In-Law May Lead to an Increase in the Number of Stress Bacteria in the Gut" (Weihnachten…, 2019). Although the above articles are not strictly scientific, one can observe the reader's interest in the original paper published in a reputable scientific journal with a high impact factor.

In the scientific journal "Geology" we come across the title of the article "Great Big Boulders I Have Known" (Beaty, 1989). The author uses the personal pronoun "I" as a device for creating expressiveness. The author of the article "Space - The Final Frontier for Economists and Elephants" (Space – the Final Frontier…, 2004) in order to draw readers' attention to his work, uses the precedent statement "Space - The Final Frontier" from William Shatner's speech as Captain James T. Kirk in the popular series "Star Trek". I. Sternin also resorts to the precedent text (related to A. Pushkin's famous quotation from "Eugene Onegin") in the title of his article "How to Make Oneself Respected? A Philologist Speaks about the Urgent" (Sternin, 2017). The title of N.W. Goodman's paper "From Shakespeare to Star Trek and beyond: A Medline search for literary and other allusions in biomedical titles" (Goodman, 2005) also includes

a precedent name and a well-known pop-culture phenomenon. Further titles that contain some unusual or humorous references include "The Hitchhiker's Guide to Flow Chemistry" (Plutschack et al., 2017); "Will Any Crap We Put into Graphene Increase Its Electrocatalytic Effect? " (Wang et al., 2020); "Who's Afraid of the Big Bad Whorf? Crosslinguistic Differences in Temporal Language and Thought" (Casasanto, 2008).

The analysis of scientific article titles showed that the tendency to "freely handle" titles is not so pronounced in Russian journals whose publishers generally require strict, short titles that reflect the essence of the work and exclude the author's eloquence. In this respect, the corpus of the studied material showed that the selected titles from non-Russian Scopus journals on natural science topics allow deviations from strictly sci-entific formulations in favor of an informal and emotional context, while Russian journals impose stricter requirements for titles.

Linguistic means of expressiveness in scientific discourse

In order to illustrate the above, we turn to monographies, Scopus articles and academic texts examples selected from the British National Corpus of English (BNC), the selection is limited by academic contexts.

As is known, in academic writing there has been a tradition of avoiding the use of the personal pronoun "I", replacing it with the pronoun "we". However, today we come across numerous cases of "personifying" achievements through the extensive use of "I": "in many modern scientific works, the linguistic and emotional personality of their authors is increasingly designated through the personal pronoun "I", through the cognitive-emotional position of the author, through their emotional argumentation" (Shahovskij, 2008, p. 269). Thus, we find in one scientific article (Banks, 2018) 18 uses of the personal pronoun "I" in different contexts (I would like to consider; I shall start by looking at how…; I shall do this in some detail; I shall look, rather more briefly, at how this…; I shall consider the implications…; I will consider the use of…; I feel it is useful to…; I shall take as an example the use of…; In the corpus that I was using for a recent study…; I also found passages…; Indeed, in my sample, I noted several examples of English that I would have considered as…; This can, I think, be related to a…; Hence, I would suggest that…, I am doubtful about the possibility…; etc.).

Also, modern scientists note "dramatic" reduction of passive voice structures which have been a feature of academic genre for many years, especially in American English (Seoane, 2006, p.107; Gómez-Cabranes, 2013).

The analysis of the empirical material shows that the revised texts contain lexical and stylistic means of expressiveness, which include:

metonymy (*Acrilic has taken over the art world*) (Lakoff and Johnson, 2004, p. 61);

metaphors (*It should also throw light on how lack of response to iron treatment points to the need for further colonic assessment*) (BNC);

epithets (*More recently Abraham and co-workers have extended this work to the helium-xenon system, where the helium partial pressure allows the degree of inhomogeneous broadening to be varied as a control parameter, with beautiful results*…(BNC); *They became difficult teenagers, leading to disputes with local political authorities. Both suffered violent deaths. The sad consequence on the children's lives of the circumstances of their birth led me to the conclusion that pregnancy in elderly women might not be appropriate and the whole programme was stopped*) (BNC);

intensifiers: extreme, perfect, complete, pure, utter; actually, certainly, clearly, definitely, obviously, really (*Although this basic classification will suffice for the vast majority of hypertensive diabetics, it is extremely important to delineate the numerically small percentage of those whose elevated blood pressure is associated with neuropathy as these will present an additional therapeutic challenge* (BNC); *The oscillation is surprisingly large, up to 25%, even when the one very large variation is excluded*) (BNC);

quantifiers: multitude of, millions of, a few thousand, several thousand, many thousand, a couple of (*Electronic publishing is a rapidly growing area with a multitude of different systems and techniques available*) (BNC);

phraseological units (*While these approaches may have a grain of truth in them, they founder in the evidence of women's actual political activity around their own demands* (BNC); *The acquisition of a stereotype by a subgroup of the population usually works to its detriment, and although perhaps*

preserving a grain of truth in relation to the subgroup's activities, it is also misleading for members of the whole population who use the stereotype) (BNC).

The most frequent syntactic means of scientific text expressiveness include:

inversion (*In terms of social contact, not only did clients in institutional settings receive on-ly small amounts of contact from staff, the majority of people were never ever observed receiving contact from other clients* (Shahovskij, 2008). *Only in 1978 did it become apparent that both effects are necessary, but also sufficient, to produce the observed phenomena)* (BNC);

comparative constructions (*We may now represent the mental capacities of the cerebral hemispheres of an advanced organism in a simple model that gets us far closer to the condition of our own species*) (BNC);

rhetorical questions (*The integration problem: how do we combine knowledge from differ-ent levels? Should the search for a valid path be data-driven or goal-driven?)* (BNC);

exclamatory sentences (*True pedants add the proviso that an edge cannot also be a node. Imagine what the graph would look like if it was!* (BNC) *For such people a systems approach is not a bad idea! Which is not a bad idea either!)* (BNC);

imperative constructions (*Consider for a minute the tenacity that the concept of "form" has had in design even amongst those most determined to eradicate the idea of "aesthetics"* (BNC); *There is always a trivial algorithm for searching in a finite space -- just list all nodes, and examine them in turn)* (BNC);

lexical repetition (*For such people a systems approach is not a bad idea! Which is not a bad idea either!*) (BNC).

It should be noted that the elocutionary possibilities of scientific discourse (for example, in the genre of a modern review) cover not only figures and various transfers, but also informal logic techniques.

Conclusions

Expressiveness of a statement implies mutual relationships between the subject and the object, which influence each other's functioning and are a vivid reflection of the human factor in language, regardless of the type of discourse. The formation and development of a formal scientific style does not mean the absence of passions and emotions in academic discourse, whose indispensable parts are polemics and discussions. Moreover, emotions perform a heuristic function in the process of a scientific experiment, as evidenced by great scientists and their achievements.

Post-non-classical science, having revised the foundations of scientific classics and taking into account the role of man in the study, not only allows expressive means, but also presupposes them. Despite the obvious antinomy, the informative and expressive functions of language in a scientific text successfully "coexist", promoting the act of communication.

The linguistic expressive means of academic writing are: metaphors, metonymies, epithets, intensifying adverbs, quantifiers, inversion, exclamatory and imperative sentences, comparative constructions, repetitions, rhetorical questions, active use of the personal pronoun "I" as a way of self-presentation of the scientist, the use of precedent texts, the assertion of the author's style and gender identity.

In conclusion it should be noted that incorporating emotions into academic writing does pose challenges, particularly in maintaining the reliability and scholarly manner expected in academic contexts. Striking a balance between emotional engagement and critical analysis is crucial. Scientists should learn to discern when and how to express emotions so that they promote their postulates rather than detract from them. It is also important to avoid overly sentimental language or unfounded emotional claims, which can undermine the rigor of academic discourse.

Conflict of interests

The authors declare no conflict of interest.

Author Contributions

Conceptualization A.B. and M.B.; methodology, M.B. and L.A.; writing—original draft preparation, M.B. and L.A.; writing—review and editing, L.A. All authors have read and agreed to the published version of the manuscript.

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